

SN 09/131,717 (3Com-7)

\*\*\*SUBSTITUTE CLAIMS - 3/2/01\*\*\*

-63-

**What is claimed is:**

- 1 1. A method of processing and storing data in a  
2 computer system including processor circuitry, and a data  
3 storage device, the method comprising the steps of:  
4 storing first and second sets of records in  
5 separate first-in, first-out data structures,  
6 respectively, on the data storage device, the first and  
7 second sets of records being of different data  
8 resolutions and corresponding to overlapping periods of  
9 time;  
10 operating the processor circuitry to receive  
11 data collected over a period of time; and  
12 operating the processor circuitry to update, in  
13 parallel, at least one record in each of the stored first  
14 and second sets of records with the received data such  
15 that a previous record included in each of the first and  
16 second data structures is replaced.
- 1 3. The method of claim 1, further comprising the step  
2 of:  
3 allocating fixed amounts of storage space on  
4 the data storage device for storing each one of the first  
5 and second first-in, first-out data structures used to  
6 store the first and second sets of records.
- 1 4. The method of claim 1, wherein the first set of  
2 records include hourly records and the second set of  
3 records includes daily records.

SN 09/131,717 (3Com-7)

\*\*\*SUBSTITUTE CLAIMS - 3/2/01\*\*\*

-64-

1 5. The method of claim 1, further comprising the step  
2 of:  
3 periodically collecting network traffic data;  
4 storing the collected network traffic data in a  
5 buffer; and  
6 operating the processor circuitry to retrieve  
7 network traffic data from the buffer, the retrieved  
8 network traffic data being received by the processor  
9 circuitry.

1 6. The method of claim 5,  
2 wherein the network traffic data stored in the  
3 buffer includes time stamp information indicating the  
4 period of time in which the network traffic data was  
5 collected; and  
6 wherein the step of operating the processor  
7 circuitry to update at least one record in each of the  
8 stored first and second sets of records includes the step  
9 of:  
10 examining at least one time stamp included in  
11 the buffered network traffic data.

1 7. A method of processing and storing data in a  
2 computer system including processor circuitry, and a data  
3 storage device, the method comprising the steps of:  
4 storing first and second sets of records in  
5 separate first-in, first-out data structures,  
6 respectively, on the data storage device, the first and  
7 second sets of records being of different data

SN 09/131,717 (3Com-7)

\*\*\*SUBSTITUTE CLAIMS - 3/2/01\*\*\*

-65-

8 resolutions and corresponding to overlapping periods of  
9 time;  
10 operating the processor circuitry to receive  
11 data collected over a period of time; and  
12 operating the processor circuitry to update at  
13 least one record in each of the stored first and second  
14 sets of records with the received data such that a  
15 previous record included in each of the first and second  
16 data structures is replaced;  
17 periodically collecting network traffic data,  
18 wherein the collected network traffic data includes byte  
19 and packet count information associated with each of a  
20 plurality of monitored conversations between devices  
21 included in the computer system;  
22 storing the collected network traffic data in a  
23 buffer; and  
24 operating the processor circuitry to retrieve  
25 network traffic data from the buffer, the retrieved  
26 network traffic data being received by the processor  
27 circuitry;  
28 wherein the step of operating the processor  
29 circuitry to update at least one record in each of the  
30 stored first and second sets of records includes the  
31 steps of:  
32 updating a record corresponding to a first  
33 conversation in the first set of records; and  
34 updating a record corresponding to the first  
35 conversation in the second set of records.

SN 09/131,717 (3Com-7)

\*\*\*SUBSTITUTE CLAIMS - 3/2/01\*\*\*

-66-

1       8.    The method of claim 5,  
2                wherein the processor circuitry includes first  
3   and second central processing units, and  
4                wherein the step of operating the processor  
5   circuitry to update at least one record in each of the  
6   stored first and second sets of records includes the step  
7   of operating the first processor to update the first set  
8   of records while operating the second processor to update  
9   the second set of records.

1       9.    The method of claim 1,  
2                wherein the processor circuitry includes first  
3   and second central processing units, and  
4                wherein the step of operating the processor  
5   circuitry to update at least one record in each of the  
6   stored first and second sets of records includes the step  
7   of operating the first processor to update the first set  
8   of records while operating the second processor to update  
9   the second set of records.

1       10.   The method of claim 5, wherein the computer system  
2   further includes a display device, the method further  
3   comprising the step of:  
4                displaying data corresponding to overlapping  
5   periods of time at different resolutions on the display  
6   device.

SN 09/131,717 (3Com-7)

\*\*\*SUBSTITUTE CLAIMS - 3/2/01\*\*\*

-67-

- 1 11. The method of claim 1, further comprising the step  
2 of:  
3 allocating storage space for storing the first  
4 and second sets of records in the first and second  
5 first-in, first-out data structures, respectively.
- 1 12. A method of collecting and processing network  
2 traffic data, comprising the steps of:  
3 periodically collecting network traffic data  
4 from a data probe,  
5 generating a database of network traffic  
6 information from the collected network traffic data, the  
7 database comprising a plurality of network traffic data  
8 sets of differing degrees of data resolution  
9 corresponding to overlapping network traffic time  
10 periods,  
11 storing each of the plurality of network traffic  
12 data sets in a different first-in, first-out data  
13 structure wherein a limited amount of data storage space  
14 is used for each of the different first-in, first out  
15 data structures,  
16 updating, in parallel, at least one record in the  
17 different first-in, first-out data structures with the  
18 collected network traffic data, and  
19 overwriting the oldest data records in the  
20 first-in, first-out data structure used to store one of  
21 the network traffic data sets, when the limited amount of  
22 data storage space used for said first-in, first-out data  
23 structure is filled with records.

SN 09/131,717 (3Com-7)

\*\*\*SUBSTITUTE CLAIMS - 3/2/01\*\*\*

-68-

1 13. The method of claim 12, wherein the differing  
2 degrees of resolution correspond to measurement time  
3 periods of different duration.

1 14. The method of claim 12,  
2 wherein the collected network traffic data  
3 includes a plurality of traffic data counter values; and  
4 wherein each traffic data counter value in the  
5 collected network traffic data includes information  
6 corresponding to an individual monitored conversation,  
7 the step of generating a database including the step of  
8 generating from the information on each different  
9 monitored conversation, a different record in each set of  
10 the plurality of network traffic data sets.

1 17. A system for monitoring network traffic data,  
2 comprising:  
3 a plurality of network traffic data probes for  
4 collecting network traffic information;  
5 processor circuitry coupled to the network  
6 traffic probes for receiving data therefrom; and  
7 a data storage device for storing a network  
8 traffic database generated by the processor circuitry  
9 using data collected by the network traffic data probes,  
10 the data storage device including:  
11 a plurality of data structures, each data  
12 structure being a first-in, first-out data structure,  
13 each one of the plurality of data structures including  
14 network traffic data:

SN 09/131,717 (3Com-7)

\*\*\*SUBSTITUTE CLAIMS - 3/2/01\*\*\*

-69-

15 a) stored at a different resolution than the  
16 resolution at which network traffic data is stored in the  
17 other ones of the plurality of data structures; and

18 b) corresponding to a period of time which overlaps  
19 the period of time for which network traffic data is  
20 stored in the other ones of the plurality of data  
21 structures;

22 means for updating, in parallel, at least one record  
23 in the different first-in, first-out data structures with  
24 the collected network traffic data, and

25 means for overwriting the oldest data records in the  
26 first-in, first-out data structure used to store one of  
27 the network traffic data sets, when the limited amount of  
28 data storage space used for said first-in, first-out data  
29 structure is filled with records.

1 19. The system of claim 17, wherein each one of the  
2 plurality of data structures includes a plurality of data  
3 records, each data record corresponding to a monitored  
4 network conversation.

1 20. The system of claim 17, wherein data records are  
2 arranged within each individual data structure as a  
3 function of the time the conversation to which the record  
4 corresponds was monitored.

1 21. The system of claim 20, wherein records which were  
2 monitored during the same time interval are grouped  
3 together within each individual data structure.

SN 09/131,717 (3Com-7)

\*\*\*SUBSTITUTE CLAIMS - 3/2/01\*\*\*

-70-

1 22. The system of claim 21, further comprising:  
2 means for modifying at least one network  
3 traffic data record included in each one of the plurality  
4 of data structures to reflect collected information about  
5 an individual network conversation.

1 23. The system of claim 17, further comprising:  
2 means for modifying at least one network  
3 traffic data record included in each one of the plurality  
4 of data structures to reflect collected information about  
5 an individual network conversation.

1 24. The system of claim 17, wherein the processor  
2 circuitry includes a plurality of separate central  
3 processing units which operate in parallel.

1 25. The system of claim 24, wherein each one of the  
2 plurality of data structures includes a plurality of data  
3 records, each data record corresponding to a monitored  
4 network conversation.

1 26. The system of claim 24, wherein data records are  
2 arranged within each individual data structure as a  
3 function of the time the conversation to which the record  
4 corresponds was monitored.

1 27. The system of claim 26, wherein records which were  
2 monitored during the same time interval are grouped  
3 together within each individual data structure.



SN 09/131,717 (3Com-7)

\*\*\*SUBSTITUTE CLAIMS - 3/2/01\*\*\*

-71-

1 28. The system of claim 27, further comprising:  
2 means for modifying at least one network  
3 traffic data record included in each one of the plurality  
4 of data structures to reflect collected information about  
5 an individual network conversation.

1 29. The system of claim 24, further comprising:  
2 means for modifying at least one network  
3 traffic data record included in each one of the plurality  
4 of data structures to reflect collected information about  
5 an individual network conversation.

(3COM7CLAIMS/59:ca)